The objection to the drawings under 37 CFR 1.84(p)(4) is respectfully traversed.

The objection to the drawings regarding reference numeral 34 is respectfully traversed. A new Figure 3 showing a detector element 35 is submitted for approval. Accordingly, Applicants respectfully request that the objection to the drawings regarding reference numeral 34 be withdrawn.

The objection to the drawings regarding reference numeral 16 is respectfully traversed. A new Figure 3 showing an x-ray beam 17 is submitted for approval. Accordingly, Applicants respectfully request that the objection to the drawings regarding reference numeral 16 be withdrawn.

The objection to the drawings regarding reference numeral 64 is respectfully traversed. A new Figure 4 showing an operator console 65 is submitted for approval. Accordingly, Applicants respectfully request that the objection to the drawings regarding reference numeral 64 be withdrawn.

The objection to the drawings regarding reference numeral 46 is respectfully traversed. A new Figure 7 showing reference numeral 46 next to the table is submitted for approval. Accordingly, Applicants respectfully request that the objection to the drawings regarding reference numeral 46 be withdrawn.

The objection to Claim 5 is respectfully traversed. Claim 5 has been amended. Accordingly, Applicants respectfully request that the objection to Claim 5 be withdrawn.

The rejection of Claims 2, 5, and 19 under 35 U.S.C. § 112, second paragraph, is respectfully traversed.

Claims 2, 5, and 9 have been amended in accordance with the specification and now particulary point out and distinctly claim the subject matter which the Applicants regard as the

invention. Further, Claim 2, 5, and 9 have been amended to recite "a computed tomography volume mode, an x-ray fluoro mode, and a tomosynthesis mode".

For the reasons set forth above, Applicants respectfully request that the Section 112 rejections of Claims 2, 5, and 19 be withdrawn

The rejection of Claims 1-3, 18-20, 24-27, and 35 under 35 U.S.C. § 102(b) as being anticipated by Baba et al. (U.S. Patent 5,598,453) is respectfully traversed.

Baba et al. describe an x-ray imaging apparatus which includes "an imaging-sequence controller 1, and X-ray tube 2, an X-ray grid 3...a rotary gantry 8, a bed board 9, a gantry rotation controller 10, a board transfer controller 11" (Col. 9, lines 57-62). Baba et al. further describe "the center of a part of the subject 14 to be imaged is set to be in the vicinity of the rotation center of the imaging unit" (Col. 10, lines 6-8). "The imaging-sequence controller 1 defines a movement sequence for rotating the rotary gantry 8 having a pair of X-ray detection unit 4' and X-ray tube 2 fixed thereto." (Col. 10, lines 22-24). "The bed board 9 sets a fluoroscopic and radiographic posture of the subject 14. The bed board 9 is horizontally positioned, and in a rotation imaging mode it is moved in a direction parallel to the rotation plane, on which the X-ray detection unit 4' is mounted" (Col. 10, lines 30-34). "In the case of fluoroscopic or radiographic mode (A), the collected data are displayed on the image display unit 21 (step 305) and at the same time, the bed board and imaging unit are moved for use in the next imaging operation" (Col. 12, lines 27-30).

Claim 1 recites a method of generating an image of an object using a multimode imaging system configured to operate in at least one of a plurality of modes of operation, the multimode imaging system including a source assembly, a detector assembly, and a means for positioning the source assembly and the detector assembly, the source assembly coupled to the means for positioning and including an x-ray source configured to emit x-ray signals, the detector assembly coupled to the means for positioning and including a detector, wherein the method includes "selecting at least one mode of operation; positioning the source assembly and the detector

assembly for each determined mode of operation; and generating an image of the object for each determined mode of operation."

Baba et al. do not describe nor suggest a method of generating an image of an object using a multimode imaging system configured to operate in at least one of a plurality of modes of operation, the multimode imaging system including a source assembly, a detector assembly, and a means for positioning the source assembly and the detector assembly, the source assembly coupled to the means for positioning and including an x-ray source configured to emit x-ray signals, the detector assembly coupled to the means for positioning and including a detector, wherein the method includes selecting at least one mode of operation, positioning the source assembly and the detector assembly for each determined mode of operation, and generating an image of the object for each determined mode of operation. Specifically, Baba et al. do not describe "positioning the source assembly and the detector assembly for each determined mode of operation." Rather, Baba et al. describe in fluoroscopic or radiographic mode, the bed board is horizontally positioned, and in a rotation imaging mode it is moved in a direction parallel to the rotation plane. For the reasons set forth above, Claim 1 is submitted to be patentable over Baba et al.

Claims 2-3 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-3 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-3 likewise are patentable over Baba et al.

Baba et al. is described above. Claim 18 recites an imaging system for generating an image of an object, wherein the imaging system includes a base, a positioning means movably coupled to the base, an x-ray source assembly including an x-ray source configured to emit x-ray signals and coupled to the positioning means, and a detector assembly including a detector coupled to the positioning means, wherein the system is configured to "enable an operator to select a mode of operation; alter the position of the detector assembly and the source assembly

relative to the other assembly and the object based on the selected mode; and generate an image of the object."

Baba et al. do not describe or suggest an imaging system configured to enable an operator to select a mode of operation, alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode, and generate an image of the object. Specifically, Baba et al. do not describe that an operator can "alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode." Rather, Baba et al. describe that a rotary gantry includes a pair of X-ray detection units and an X-ray tube "fixed" thereto. For the reasons set forth above, Claim 18 is submitted to be patentable over Baba et al.

Claims 19-20, 24-27 and 35 depend, directly or indirectly, from independent Claim 18. When the recitations of Claims 19-20, 24-27 and 35 are considered in combination with the recitations of Claim 18, Applicants submit that dependent Claims 19-20, 24-27 and 35 likewise are patentable over Baba et al.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-3, 18-20, 24-27, and 35 be withdrawn.

The rejection of Claims 1-3, 18-21, 24-29, and 35 under 35 U.S.C. § 102(e) as being anticipated by Roos et al. (U.S. Patent 6,041,097) is respectfully traversed.

Roos et al. describe "a large diameter track 10, on the order of 1.5 meters, is stationarily mounted to the floor...the track is a large diameter bearing whose outer race 12 is stationarily supported by a stationary support 14 and whose inner race 16 is freely rotatable within the outer race. An x-ray tube 18 is mounted to the inner race for rotation therein. A flat panel detector 20 is mounted to the inner race opposite the x-ray source" (Col. 3, lines 36-44). Roos et al. also describe "A drive motor 22 is connected with the inner race for indexing the x-ray tube and flat panel detector to selectable angular orientations around a central axis of the ring" (Col. 3, lines

51-52). "At each step, the timing and control circuit causes an x-ray tube power supply (32) to pulse the x-ray tube at radiographic energy levels in a radiographic mode of operation, and fluoroscopic energy levels in a fluoroscopic mode of operation" (Col. 3, lines 56-62). "The resolution of the acquired image data is adjustable by adjusting the displacement of the flat panel detector from the subject. More specifically, a mechanical drive 50 moves the flat panel detector toward and away from a subject" (Col. 4, lines 31-35).

Claim 1 recites a method of generating an image of an object using a multimode imaging system configured to operate in at least one of a plurality of modes of operation, the multimode imaging system including a source assembly, a detector assembly, and a means for positioning the source assembly and the detector assembly, the source assembly coupled to the means for positioning and including an x-ray source configured to emit x-ray signals, the detector assembly coupled to the means for positioning and including a detector, wherein the method includes "selecting at least one mode of operation; positioning the source assembly and the detector assembly for each determined mode of operation; and generating an image of the object for each determined mode of operation." Roos et al. do not describe nor suggest a method of generating an image of an object using a multimode imaging system wherein the method includes selecting at least one mode of operation, positioning the source assembly and the detector assembly for each determined mode of operation, and generating an image of the object for each determined mode of operation. Specifically, Roos et al. do not describe positioning the source assembly and the detector assembly for each determined mode of operation. Rather, Roos et al. describe that a flat panel detector is mounted to the inner race opposite the x-ray source, and that a control circuit causes an x-ray tube power supply to pulse the x-ray tube at radiographic energy levels in a radiographic mode of operation, and fluoroscopic energy levels in a fluoroscopic mode of operation, and that the resolution can be increased by moving the detector. For the reasons set forth above, Claim 1 is submitted to be patentable over Roos et al.

Claims 2-3 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-3 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-3 likewise are patentable over Roos et al.

Claim 18 recites an imaging system for generating an image of an object, wherein the imaging system includes a base, a positioning means movably coupled to the base, an x-ray source assembly including an x-ray source configured to emit x-ray signals and coupled to the positioning means, and a detector assembly including a detector coupled to the positioning means, wherein the system is configured "to enable an operator to select a mode of operation; alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode; and generate an image of the object."

Roos et al. do not describe or suggest an imaging system configured to enable an operator to select a mode of operation, alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode, and generate an image of the object. Specifically, Roos et al. do not describe that an operator can "alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode." Rather, Roos et al. describe that a flat panel detector is mounted to the inner race opposite the x-ray source and that the resolution can be increased by moving the detector. For the reasons set forth above, Claim 18 is submitted to be patentable over Roos et al.

Claims 19-21, 24-27 and 35 depend, directly or indirectly, from independent Claim 18. When the recitations of Claims 19-20, 24-27 and 35 are considered in combination with the recitations of Claim 18, Applicants submit that dependent Claims 19-20, 24-27 and 35 likewise are patentable over Roos et al.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-3, 18-21, 24-29, and 35 be withdrawn.

The rejection of Claims 4-7, 9-10, 15-16, 18-21, 24-27, and 34 under 35 U.S.C. § 102(b) as being anticipated by Grady et al. (U.S. Patent 4,365,343) is respectfully traversed.

Grady et al. describe an "X-ray apparatus in FIG. 1 comprises a support including an L-shaped base L with a horizontal arm La swinging on a pivot assembly P, and an upright arm Lb extending at right angles to the horizontal arm" (Col. 2, lines 1-4). Grady et al. further describe that "The radiation source housing X and the two radiation receptors II and FC are slidingly mounted on the upper and lower arms Ua and Ub respectively so that they can be moved up and down along the radiation axis A2" (Col. 2, lines 28-31).

Claim 4 recites an imaging system for generating an image of an object wherein the imaging system is configured to "operate in at least one of a plurality of modes of operation and comprising: a source assembly comprising a movable x-ray source configured to emit x-ray signals; a detector assembly comprising a movable detector; a positioning means for positioning said source assembly and said detector assembly relative to the object, said source assembly movably coupled to said positioning means and said detector assembly movably coupled to said positioning means; and a controller enabling an operator to selectively operate said system in at least one of a plurality of modes."

Grady et al. do not describe or suggest an imaging system cofigured to operate in at least one of a plurality of modes of operation wherein the imaging system includes a source assembly including a movable x-ray source configured to emit x-ray signals, a detector assembly including a movable detector, a positioning means for positioning the source assembly and the detector assembly relative to the object, the source assembly movably coupled to the positioning means and the detector assembly movably coupled to the positioning means; and a controller enabling an operator to selectively operate the system in at least one of a plurality of modes. Specifically, Grady et al. do not describe that an imaging system is configured to operate in at least one of a plurality of modes of operation wherein the imaging system also includes a controller enabling an operator to selectively operate the system in at least one of a plurality of modes. Rather,

Grady et al. describe an X-ray apparatus wherein the radiation source housing and the two radiation receptors are slidingly mounted on the upper and lower arms respectively so that they can be moved up and down along the radiation axis. For the reasons set forth above, Claim 4 is submitted to be patentable over Grady et al.

Claims 5-7, 9-10, and 15-16 depend, directly or indirectly, from independent Claim 4. When the recitations of Claims 5-7, 9-10, and 15-16 are considered in combination with the recitations of Claim 4, Applicants submit that dependent Claims 5-7, 9-10, and 15-16 likewise are patentable over Grady et al.

Claim 18 recites an imaging system for generating an image of an object, wherein the imaging system includes a base, a positioning means movably coupled to the base, an x-ray source assembly including an x-ray source configured to emit x-ray signals and coupled to the positioning means, and a detector assembly including a detector coupled to the positioning means, wherein the system is configured to "enable an operator to select a mode of operation; alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode; and generate an image of the object."

Grady et al. do not describe or suggest an imaging system configured to enable an operator to select a mode of operation, alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode, and generate an image of the object. Specifically, Grady et al. do not describe an imaging system configured to enable an operator to select a mode of operation and alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode. Rather, Grady et al. describe an X-ray apparatus wherein the radiation source housing and the two radiation receptors are slidingly mounted on the upper and lower arms respectively so that they can be moved up and down along the radiation axis. For the reasons set forth above, Claim 18 is submitted to be patentable over Grady et al.

Claims 19-21, 24-27 and 34 depend, directly or indirectly, from independent Claim 18. When the recitations of Claims 19-21, 24-27 and 34 are considered in combination with the recitations of Claim 18, Applicants submit that dependent Claims 19-21, 24-27 and 34 likewise are patentable over Grady et al.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 4-7, 9-10, 15-16, 18-21, 24-27, and 34 be withdrawn.

The rejection of Claim 11 under 35 U.S.C. § 103 as being unpatentable over Grady et al. (U.S. Pat. 4,365,343) in view of Gilblom (U.S. Pat. 5,949,848) is respectfully traversed.

Grady et al. is described above. Gilblom describes "An x-ray generator tube 10 generates a beam of x-rays 12 adapted to pass through an object such as a patient to be x-rayed 14 and be received by a flat amorphous silicon imaging panel 20" (Col. 3, lines 5-8).

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Grady et al. according to the teachings of Gilblom. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Grady et al. nor Gilblom, alone or in combination, describe or suggest the claimed combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically Grady et al. is cited for its teaching that an X-ray apparatus includes a radiation source housing and two radiation receptors which are slidingly mounted on the upper and lower arms respectively so that they can be moved up and down along the radiation axis, and Gilblom is cited for its teaching of a flat detector panel. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present

invention. Of course, such a combination is impermissible, and for this reason alone, Applicants respectfully request that the Section 103 rejection of Claim 11 be withdrawn.

Further, and to the extent understood, neither Grady et al. nor Gilblom, alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 11 depends from independent Claim 4 which recites an imaging system for generating an image of an object wherein the imaging system is configured to "operate in at least one of a plurality of modes of operation and comprising: a source assembly comprising a movable x-ray source configured to emit x-ray signals; a detector assembly comprising a movable detector; a positioning means for positioning said source assembly and said detector assembly relative to the object, said source assembly movably coupled to said positioning means and said detector assembly movably coupled to said positioning means; and a controller enabling an operator to selectively operate said system in at least one of a plurality of modes."

Neither Grady et al. or Gilblom, alone or in combination, describe or suggest an imaging system for generating an image of an object wherein the imaging system is configured to operate in at least one of a plurality of modes of operation and wherein the imaging system includes a source assembly including a movable x-ray source configured to emit x-ray signals, a detector assembly including a movable detector, a positioning means for positioning the source assembly and the detector assembly relative to the object, and wherein the source assembly is movably coupled to the positioning means and the detector assembly is movably coupled to the positioning means, and a controller enabling an operator to selectively operate the system in at least one of a plurality of modes. More specifically, neither Grady et al. nor Gilblom describe or suggest an imaging system configured to operate in at least one of a plurality of modes of operation wherein the imaging system includes a controller enabling an operator to selectively operate the system in at least one of a plurality of modes. Rather Grady et al. describe that an X-ray apparatus includes a radiation source housing and two radiation receptors which are slidingly mounted on the upper and lower arms respectively so that they can be moved up and down along

the radiation axis, and Gilblom describes a flat detector panel. For the reasons set forth above, Claim 4 is submitted to be patentable over Grady et al. in view of Gilblom.

Claim 11 depends directly from independent Claim 4. When the recitations of Claim 11 are considered in combination with the recitations of Claim 4, Applicants submit that dependent Claim 11 likewise is patentable over Grady et al. in view of Gilblom.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 11 be withdrawn.

The rejection of Claim 17 under 35 U.S.C. § 103 as being unpatentable over Grady et al. (U.S. Pat. 4,365,343) is respectfully traversed.

Grady et al. is described above. Applicants respectfully submit that the Section 103 rejection of the presently pending claim is not a proper rejection. As is well established, the mere assertion that it would have been obvious to one of ordinary skill in the art to have modified Grady et al. to obtain the claimed recitations of the present invention does not support a prima facia obvious rejection. Rather, each allegation of what would have been an obvious matter of design choice must always be supported by citation to some reference work recognized as standard in the pertinent art and the Applicants given the opportunity to challenge the correctness of the assertion or the notoriety or repute of the cited reference. Applicants have not been provided with the citation to any reference supporting the combination made in the rejection. The rejection, therefore, fails to provide the Applicants with a fair opportunity to respond to the rejection, and fails to provide the Applicants with the opportunity to challenge the correctness of the rejection.

Further, and to the extent understood, Grady et al. do not describe nor suggest the claimed combination. More specifically, Claim 17 depends from independent Claim 4 which recites an imaging system for generating an image of an object wherein the imaging system is configured to "operate in at least one of a plurality of modes of operation and comprising: a

source assembly comprising a movable x-ray source configured to emit x-ray signals; a detector assembly comprising a movable detector; a positioning means for positioning said source assembly and said detector assembly relative to the object, said source assembly movably coupled to said positioning means and said detector assembly movably coupled to said positioning means; and a controller enabling an operator to selectively operate said system in at least one of a plurality of modes."

Grady et al. do not describe or suggest a method as recited in Claim 4. More specifically, Grady do not describe or suggest an imaging system configured to operate in at least one of a plurality of modes of operation wherein the imaging system includes a controller enabling an operator to selectively operate the system in at least one of a plurality of modes. For the reasons set forth above, Claim 4 is submitted to be patentable over Grady et al.

Claim 17 depends directly from independent Claim 4. When the recitations of Claim 17 are considered in combination with the recitations of Claim 4, Applicants submit that dependent Claim 17 likewise is patentable over Grady et al.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 17 be withdrawn.

The rejection of Claim 34 under 35 U.S.C. § 103 as being unpatentable over Baba et al. (U.S. Pat. 5,598,453) is respectfully traversed.

Baba et al. is described above. Applicants respectfully submit that the Section 103 rejection of the presently pending claim is not a proper rejection. As is well established, the mere assertion that it would have been obvious to one of ordinary skill in the art to have modified Baba et al. to obtain the claimed recitations of the present invention does not support a prima facia obvious rejection. Rather, each allegation of what would have been an obvious matter of design choice must always be supported by citation to some reference work recognized as standard in the pertinent art and the Applicants given the opportunity to challenge the

correctness of the assertion or the notoriety or repute of the cited reference. Applicants have not been provided with the citation to any reference supporting the combination made in the rejection. The rejection, therefore, fails to provide the Applicants with a fair opportunity to respond to the rejection, and fails to provide the Applicants with the opportunity to challenge the correctness of the rejection.

Further, and to the extent understood, Baba et al. do not describe or suggest the claimed combination. More specifically, Claim 34 depends from independent Claim 18 which recites an imaging system for generating an image of an object, wherein the imaging system includes a base, a positioning means movably coupled to the base, an x-ray source assembly including an x-ray source configured to emit x-ray signals and coupled to the positioning means, and a detector assembly including a detector coupled to the positioning means, wherein the system is configured to "enable an operator to select a mode of operation; alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode; and generate an image of the object."

Baba et al. do not describe or suggest an imaging system as recited in Claim 18. More specifically, Baba et al. do not describe or suggest that an operator can "alter the position of the detector assembly and the source assembly relative to the other assembly and the object based on the selected mode." Rather, Baba et al. describe that a rotary gantry includes a pair of X-ray detection units and an X-ray tube "fixed" thereto. For the reasons set forth above, Claim 18 is submitted to be patentable over Baba et al.

Claim 34 depends directly from independent Claim 18. When the recitations of Claim 34 are considered in combination with the recitations of Claim 18, Applicants submit that dependent Claim 34 is likewise are patentable over Baba et al.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 34 be withdrawn.

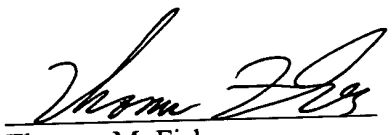
Claims 8, 12-14, 22-23, and 30-33 were indicated as being allowable if amended to incorporate the recitations of the base claim and any intervening claims. Claims 8 and 12-14 depend, directly or indirectly, from independent Claim 4 which is submitted to be in condition for allowance. When the recitations of Claims 8 and 12-14 are considered in combination with the recitations of Claim 4, Applicants submit that dependent Claims 8 and 12-14 are also in condition for allowance.

Claims 22-23 and 30-33 depend, directly or indirectly, from independent Claim 18 which is submitted to be in condition for allowance. When the recitations of Claims 22-23 and 30-33 are considered in combination with the recitations of Claim 18, Applicants submit that dependent Claims 22-23 and 30-33 are also in condition for allowance.

For the reasons set forth above, Applicants respectfully requests that the objections to Claims 9-15 and 24-30 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| Applicant: Senzig et al. | : | Art Unit: 2882 |
| Serial No.: 09/451,965 | : | Examiner: Ho, A. |
| Filed: November 30, 1999 | : | |
| For: IMAGING SYSTEM FOR GENERATING HIGH QUALITY IMAGES | : | |

**SUBMISSION OF MARKED UP PARAGRAPHS AND CLAIMS**

Hon. Assistant Commissioner for Patents
Washington, D.C. 20231

Submitted herewith are marked up Paragraphs and Claims in accordance with 37 C.F.R. 1.121(c)(1)(ii) with additions underlined and deletions [bracketed].

IN THE SPECIFICATION

Please delete the title and replace with the following title:

MULTIMODE IMAGING SYSTEM FOR GENERATING HIGH QUALITY IMAGES

Please delete the paragraph beginning on page 5 at line 21 and ending on page 5 at line 24, and replace with the following replacement paragraph:

Detector 32, in one embodiment, is formed by a plurality of detector elements 35 [34] which together sense the projected x-rays that pass through the object to collect image data. Detector 32 may be fabricated in a single slice, a multi-slice, or flat panel configuration.

Please delete the paragraph beginning on page 5 at line 25 and ending on page 6 at line 8, and replace with the following replacement paragraph:

In one embodiment, detector 32 is a solid state detector or radiation imager comprising a large flat panel imaging device having a plurality of pixels 35 [34] arranged in rows and columns. Each pixel 35 [34] includes a photosensor (not shown), such as a photodiode, that is coupled via a switching transistor (not shown) to two separate address lines, a scan line and a data line. In each row of pixels, each respective switching transistor (typically a thin film field effect transistor (FET)) is coupled to a common scan line through that transistor's gate electrode. In each column of pixels, the readout electrode of the transistor (e.g., the source electrode of the FET) is coupled to a data line, which in turn is selectively coupled to a readout amplifier. During nominal operation, x-ray beams 17 [16] passing through the object, for example a patient, being examined are incident on imaging array 32. The radiation is incident on a scintillator material and the pixel photosensors measure (by way of change in the charge across the diode) the amount of light generated by x-ray interaction with the scintillator. As a result, each detector element, or pixel, 35 [34] produces an electrical signal that represents the intensity of an impinging x-ray beam and hence the attenuation of beam 17 [16] as it passes through the object. During a scan to acquire x-ray projection data in one mode defined as a CT volume rotation mode, detector assembly 30 and source assembly 26 are rotated about the object.

Please delete the paragraph beginning on page 6 at line 9 and ending on page 6 at line 18, and replace with the following replacement paragraph:

In another embodiment of detector 32, x-rays 17 [16] can directly generate electron-hole pairs in the photosensor (commonly called "direct detection"). The photosensor charge data are read out by sequentially enabling rows of pixels (by applying a signal to the scan line causing the switching transistors coupled to that scan line to become conductive), and reading the signal from the respective pixels thus enabled via respective data lines (the photodiode charge signal being coupled to the data line through the conductive switching transistor and associated readout

electrode coupled to a data line). In this way a given pixel can be addressed though a combination of enabling a scan line coupled to the pixel and reading out at the data line coupled to the pixel.

Please delete the paragraph beginning on page 7 at line 5 and ending on page 7 at line 11, and replace with the following replacement paragraph:

Computer 62 also receives commands and scanning parameters from an operator via a console 65 [64] that has a keyboard. An associated cathode ray tube display 66 allows the operator to observe the reconstructed image and other data from computer 62. The operator supplied commands and parameters are used by computer 62 to provide control signals and information to DAS 58, x-ray controller 54 and motor controller 56. Computer 62 operates a table motor controller 68 which controls position of motorized table 46 relative to system 10.

Please delete the paragraph beginning on page 7 at line 26 and ending on page 8 at line 6, and replace with the following replacement paragraph:

In one embodiment, a partially defective panel 100, i.e., known portions of panel elements 35 [34] are non-responsive to x-ray signals, may be utilized to generate images of object 50. This may be accomplished by altering the distance between source 28 and detector 32. Specifically, the distance between source 28 and detector panel 100 is reduced so that the area of x-ray signal exposure is limited to the functioning portion of panel 100. For example, where any number of detector panel elements 35 [34] are non-responsive so that the right 25% of panel 100 is unusable, the distance between detector 32, specifically panel 100, relative to source 28 may be altered so that the data is collected from the remaining 75% of panel 100. In another embodiment, detector panel 100 and/or source 28 may be positioned so that only the center 50% of panel 100 is utilized and the known defective 25% right and a corresponding 25% of the left side of panel 100 are unused to generate the image. The partially defective panel 100 may also be used by collimating x-ray beam 17 [16] from source 28, using a collimator (not shown), so

that the defective portion of panel 100 is not exposed to x-rays 17 [16]. As a result, x-ray dose to patient 50 [22] is reduced.

Please delete the paragraph beginning on page 9 at line 1 and ending on page 9 at line 27, and replace with the following replacement paragraph:

Prior to selecting the CT volume rotating mode of system 10 by the operator, system 10 is positioned relative to object 50. As a result of the shape of arm 16, system 10 may be easily positioned adjacent to table 46. For example and referring again to Figure 5, [as shown in Figure 6,] where images are desired of a certain area of object 50, i.e., the lower portion of a patient's leg, system 10 is placed relative to table 46 so that arm 16 rotates about table 46. More specifically, system 10 is positioned near the end of table 46 so that as arm 16 rotates about a Z axis of object 50, source assembly 26 and detector assembly 30 move relative to table 46. Particularly and in one embodiment, arm 16 rotates about 180 degrees plus a fan angle about base 14. Arm 16 is rotated relative to base 14, source assembly 26 and detector assembly 30 are rotated about object 50 and table 46. X-rays signals are emitted from source 28 and collected by detector 32 as arm 16 is rotated. The signals collected from detector 32 are processed in a manner known in the art to generate an image of object 50, i.e., an image along the plane of interest of the patient's leg. More specifically and in one embodiment, arm 16 rotates about base 14 at a fairly slow speed, i.e., 3 to 10 seconds per rotation, and data is collected for each row of elements 32. Reconstructed images are then generated using data collected from elements 35 [34] of detector 32. In one embodiment, the reconstructed images for each row of detector 32 [34] are then combined to form a 3D image of object 50. The 3D image, in one embodiment, is a volume display, to understand the location of the elements contained within object 50, for example the bones within the patient. As described above, where detector 32 is non-symmetrical, the orientation of detector 32 may be altered to select the appropriate coverage area, i.e., a larger X-axis coverage area, and Field of View (FOV), i.e., a larger Z-axis coverage area. After the images are generated, the operator may reposition system 10 relative to object 50

or select a different mode of operation. In addition, if the operator has completed all tasks, system 10 may be removed without interfering with or disturbing object 50.

Please delete the paragraph beginning on page 9 at line 29 and ending on page 10 at line 7, and replace with the following replacement paragraph:

The CT volume sliding mode allows image generation of objects having a shape, placement, or configuration which are difficult or impossible to image using known imaging systems. More specifically, and as shown in Figures 4 and 7 where system 10 is placed along one of the sides of table 46, arm 16 is moved relative to base 14 so that source assembly 26 and detector assembly 30 are moved perpendicular to table 46. Particularly, as arm 16 is moved relative to base 14, source assembly 26 and detector assembly 30 traverse around object 50 so that plane of interest 34 is parallel to surface 52 of table 46. For example as shown in Figure 7 [5], in order to scan object 50 positioned on table 46, arm 16 is moved relative to base 14 so that the respective distances between arm first end portion 22 and base 14 and between second end portion 24 and base 14 are altered. More specifically and in one embodiment, arm 16 is moved relative to base 14 so that source assembly 26 is a maximum distance from base 14 and detector assembly is a minimum distance from base 14.

Please delete the paragraph beginning on page 10 at line 19 and ending on page 10 at line 34, and replace with the following replacement paragraph:

Once at least one 3D image has been generated for object 50 using one of the other modes, system 10 is placed into the X-ray fluoro mode to locate in elements within object 50. In one embodiment as shown in Figure 8 [7], where system 10 is positioned along one side of table 46, arm 16 is positioned relative to object 50 and is fixed in position, i.e., arm 16 is positioned so that plane of interest 34 is parallel to base 14 and source assembly 26 and detector assembly 30 are an equidistance from base 14. The distance between source 26 and detector 30 is then adjusted for the selected area to be scanned. Source 28 is then enabled and image data is collected. Source 28 can then be translated along the Z axis of object 50, i.e., the patient, to

locate the desired element within the object, i.e., a bone of interest, as the position of detector 32 remains fixed. As source 28 is translated, a series of real-time images along plane of interest 34 are generated in accordance with known fluoroscopy methods to determine the location of the desired element within object 50. A pseudo three dimensional image may then be generated by combining multiple images taken at different angles. This will yield additional depth information not found in a conventional single position image.

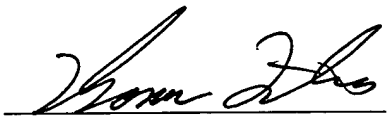
IN THE CLAIMS

2. (once amended) A method in accordance with Claim 1 wherein selecting at least one mode of operation, said method comprises the step of selecting at least one of a computed tomography volume mode, an x-ray fluoro mode, [a fluoroscopy mode,] and a tomosynthesis mode[, and a volume computed tomography mode].

5. (once amended) A method in accordance with Claim 4 wherein said plurality of modes comprises at least one of a computed tomography volume mode, an x-ray fluoro mode, [a fluoroscopy mode,] and a tomosynthesis mode[, and a volume computed tomography mode].

19. (once amended) A system in accordance with Claim 18 wherein to enable the operator to select a mode, said system is configured enable the operator to select at least one of a computed tomography volume mode, an x-ray fluoro mode, [a fluoroscopy mode,] and a tomosynthesis mode[, and a volume computed tomography mode].

Respectfully Submitted,



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